

REMARKS

Upon entry of the above amendments, claims 46-91 will be pending, claims 55, 63, 70, 74, 79, and 80 are amended, without prejudice to their further prosecution. Applicants reserve the right to pursue subject matter that will no longer be pending after the amendment above, or which has not yet been pursued, in a related application. The claim amendments add no new matter as there is basis in the specification throughout and in the claims as filed.

Applicants thank the Examiner for considering Applicants' arguments, filed January 22, 2007, and for withdrawing certain rejections. Claims 46-62, 66-69, 73, and 84-91 were rejected under 35 U.S.C. §103 in the April 11, 2007 Non-final Office Action. Claims 63-65, 70-72, 74, and 79-93 were objected to as being dependent upon a rejected base claim, the Examiner stating that they would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants respectfully request that the pending claims be allowed in view of the remarks and amendments herein.

Claim Rejections – 35 USC §103

Claims 46, 66-69, 73, 77, 78, and 84-91 were rejected under 35 U.S.C. 103 (1) as being unpatentable over Green et al. (US PAT 5,853,979) in view of Dunkel (US PAT 5,572,125). The pending claims are generally directed to a method, computerized system, system, and machine readable program for analyzing large amounts of DNA. In brief, the claims are directed to an automated method, computerized system, system, and machine-readable program for identifying a component in a DNA sample using a mass spectrometer to generate a computer readable data set, denoising the data, correcting a baseline from the denoised data to generate an intermediate data set, defining putative peaks in the intermediate data set, generating a residual baseline by removing the putative peaks from the intermediate data set, removing the residual data set from the intermediate data set to generate a corrected data set, locating a putative peak in the corrected data set, and identifying the component that corresponds to the located putative peak.

The Examiner cited Green as teaching

A method, a computerized system, system, and machine-readable program operating on a computer for identifying a component in a DNA sample using a mass spectrometer (Col. 5, line 18) to generate a machine readable data set and analyzing the data by performing noise reduction to generate denoised data, correcting a baseline for the denoised experimental data representing an intermediate data set, defining peaks in the intermediate data set as “fragment pattern” (col. 5, lines 9-43). Green et al further teach the computer is integral to the instrument (claim 85) (col. 16, lines 27-39). (April 11, 2007 Office Action at 3).

The Examiner pointed out that “Green et al do not teach the removal of peaks and subsequent generation and removal of a residual baseline from the denoised experimental data.” (April 11, 2007 Office Action at 3). The Examiner stated that Dunkel et al “teach a method of automated analysis and correction of spectral data obtained through ion cyclotron mass spectrometry (col. 1, lines 16-19). The Examiner further stated that

Dunkel et al teach that the residual baseline obtained by removing peaks from experimental data can be applied to the experimental data to correct for baseline distortion (col. 11, lines 2-3). Dunkel teach the generation of a residual baseline by subtracting modeled peak data from the experimental ‘intermediate’ data (claims. 67-69) (col. 20, lines 40-45) Dunkel et al teaches identifying includes identifying peak probabilities for the putative peak and is derived using signal to noise ratio (claims. 77, 78, 88, 89, 90) (col. 32, lines 27-29 and 48-51; and col. 33, lines 3 and 15-20). Dunkel et al. teach the modeling of peaks by fitting a Gaussian curve (claim. 73) (col. 8, lines 5-7). Dunkel et al teach performing a mass shift of the peak position (claim 66) (col. 2, lines 43-46).

The Examiner stated that it would have been “obvious to one of skill in the art to combine the method for correction of spectral data of Dunkel with the method intermediate data set generation of Green et al because Green et al teach that other signal processing techniques can be applied to generate clean, corrected data (col. 5, lines 47-49) and Dunkel teaches that baseline correction can be corrected by subtracting the residual baseline.” The Examiner found that one “would have been motivated to do so because Dunkel teaches that the residual baseline subtraction speeds up data analysis, improves the reliability of signal detection, and allows for the analysis of data sets of increased complexity (col. 33, lines 62-67).”

Applicants respectfully traverse this rejection. The Examiner has not pointed out a

teaching in Dunkel that states that a residual baseline is generated by removing putative peaks from the intermediate data set, and that this residual baseline is used to correct the intermediate data set. In the passage in Dunkel cited by the Examiner (col. 11, lines 2-3), it states only that “This correction function can be applied to the residual data to correct for the baseline distortion before adding the residual data to the calculated data, can be applied to the composite sum of the calculated and residual data, *or can be applied directly to the experimental data to correct for baseline distortion.*” (col. 10, line 65-col. 11, line 3; cited passage in italics). Applicants have not found, in the related passages of the patent, any teaching that the residual baseline is generated by removing putative peaks from the intermediate data set, or from any data set. Although, at the bottom of column 10, Dunkel discusses the use of mathematical models to define the baseline contribution to the signal shapes, Applicants have not found a teaching in Dunkel that the baseline is determined by removing putative peaks from an experimental, or intermediate data set. The Examiner cites also to column 20, lines 40-45 as teaching the generation of residual baseline by subtracting modeled peak data from the experimental intermediate data. This passage states “For the phase correction provided by the YES branch, the program first determines the unphased residual spectrum by subtracting the unphased simulated or modeled spectrum from the experimental spectrum. This residual spectrum includes the signals, noise, or other data not considered in the modeled calculated spectrum.” Applicants believe that this passage does not teach the removal of putative peaks from an experimental data set (intermediate data set) to generate a baseline, instead, it discusses subtracting a modeled spectrum from the experimental spectrum. Further, this passage relates to phase correction, not peak correction. In the NMR system that the passage addresses, there are phase issues that need to be addressed. In the mass spectrometer spectra of the present claims, there is no need for this type of correction, as the spectra do not have phase information.

Applicants therefore respectfully request that the Examiner withdraw the rejection of claims 46, 66-69, 73, 77, 78, and 84-91.

Claim 47 was rejected under 35 U.S.C. 103(a) as unpatentable over Green, Dunkel, and further in view of Stanton et al. (US PAT 6,440,705). In view of the arguments presented above that Green and Dunkel do not teach removing the putative peaks from the intermediate data set to generate a residual baseline, then removing the residual baseline from the intermediate data

set, Stanton does not provide this missing teaching. Therefore, Applicants respectfully request that this rejection be withdrawn.

Claims 48-58 were rejected under 35 USC 103(a) as unpatentable over Green, in view of Dunkel, and further in view of Shew et al (US PAT 5,436,447). In view of the arguments presented above that Green and Dunkel do not teach removing the putative peaks from the intermediate data set to generate a residual baseline, then removing the residual baseline from the intermediate data set, Shew does not provide this missing teaching. Therefore, Applicants respectfully request that this rejection be withdrawn.

Claims 59-62 were rejected under 35 USC 103(a) as unpatentable over Green, in view of Dunkel, and further in view of Gavin et al (US PAT 6,586,728). In view of the arguments presented above that Green and Dunkel do not teach removing the putative peaks from the intermediate data set to generate a residual baseline, then removing the residual baseline from the intermediate data set, Gavin does not provide this missing teaching. Therefore, Applicants respectfully request that this rejection be withdrawn.

Claim Objections

Claims 63-65, 70-72, 74, and 79-83 were objected to as being dependent upon a rejected base claim, but, the Examiner stated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants thank the Examiner for suggesting these changes. For purposes of expediting prosecution of these claims, Applicants have rewritten them in independent form. Applicants therefore respectfully request that these claims be allowed.

CONCLUSIONS

Applicants respectfully submit that, after submission of this Amendment, all pending claims will be in condition for allowance, and they earnestly solicit an early notice to such effect. That said, should any issues or questions remain, the Examiner is encouraged to telephone the undersigned at **(760) 473-9472** so that they may be promptly resolved.

Respectfully submitted,

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By: /Sheryl R. Silverstein/

Sheryl R. Silverstein
Registration No. 40,812
Grant Anderson, LLP
6540 Lusk Blvd., Suite C210
San Diego, California 92121
760-473-9472